

CLAIMS

1. A method for recovering platinum group elements comprising:

charging into a closed electric furnace and melting, together with flux components and a reducing agent, a platinum group element-containing substance to be processed and a copper source material containing copper oxide;

sinking molten metal of primarily metallic copper below a molten slag layer of primarily oxides; and

enriching the platinum group elements in the molten metal sunk below, which method for recovering platinum group elements is characterized in that molten slag whose copper content has decreased to 3.0 wt% or less is discharged from the electric furnace.
2. A method for recovering platinum group elements according to claim 1, wherein the copper source material charged into the electric furnace is composed of granules of an average grain diameter of not less than 0.1 mm and not greater than 10 mm.
3. A method for recovering platinum group elements according to claim 1, wherein the interior of the electric furnace is maintained at a pressure lower than atmospheric pressure from the melting of the charge material to the discharging of the molten slag.
4. A dry method for recovering platinum group elements comprising:

charging into a closed electric furnace and melting, together with flux components and a reducing agent, a platinum group element-containing substance to be processed and a copper source material containing copper oxide;

sinking molten metal of primarily metallic copper below a molten slag layer of primarily oxides;

enriching the platinum group elements in the molten metal sunk below;

separating the molten metal enriched in the platinum group elements from the molten slag and transferring it to a separate furnace while still in the molten state;

oxidizing the molten metal in the separate furnace to separate it into a slag layer of primarily oxides and a molten metal layer further enriched in the platinum group elements,

which method for recovering platinum group elements is characterized in that molten slag whose copper content has decreased to 3.0 wt% or less is discharged from the electric furnace and the molten slag generated in the separate furnace is water-cooled from a high-temperature state to obtain a copper source material containing the aforesaid copper oxide composed of granules having a grain diameter of not less than 0.1 mm and not greater than 10 mm.

5. An apparatus for recovering platinum group elements comprising:
 - a furnace body having an interior space substantially shut off from external air;
 - a material charging port and an exhaust port provided in an upper half of the furnace body;
 - at least two fluid discharge ports provided in a lower half of the furnace body at different height levels;
 - a material charging chute connected to the material charging port;
 - an exhaust unit connected to the exhaust port; and
 - electrodes for passing electric current through and heating material charged into the furnace,

wherein charged material including oxide-based starting material entraining at least one platinum group element, copper oxide, solid reducing agent and flux is melted in the furnace under a reducing atmosphere substantially shut off from external air while operating the exhaust unit to discharge gas generated in the furnace, metallic fluid of high platinum

group element concentration is taken out from the low-level fluid discharge port and slag-like fluid of low platinum group element concentration is taken out from the high-level fluid discharge port.

6. An apparatus for recovering platinum group elements according to claim 5, wherein a mixture of granular oxide-based starting material entraining at least one platinum group element, granular copper oxide, powdery solid reducing agent and powdery flux is conducted through the material charging chute.

7. An apparatus for recovering platinum group elements according to claim 5, wherein only part of the metallic fluid of high platinum group element concentration is taken out from the low-level fluid discharge port and only part of the slag-like fluid of low platinum group element concentration is taken out from the high-level fluid discharge port, whereafter new charge material is supplied through the material charging chute and melting is continued, with the remainders of the fluids left in the furnace.